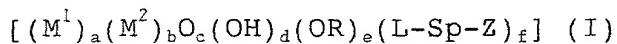


Patent Claims

1. Dental material containing a cluster according to the general formula



in which

M^1 , M^2 independently of each other, stand for a metal atom of the IIIrd or Vth main groups or the Ist to VIIth sub-groups of the periodic table;

R is an alkyl group with 1 to 6 carbon atoms;

L is a co-ordinating group with 2 to 6 complexing centres;

Sp is a spacer group or is absent;

Z is a polymerizable group;

a is a number from 1 to 20;

b is a number from 0 to 10;

c is a number from 1 to 30;

d, e independently of each other, are in each case a number from 0 to 30;

f is a number from 2 to 30,

any charge of the cluster (I) present being equalized by counterions.

2. Dental material according to claim 2, characterized in that the variables have the following meanings:

M^1 , M^2 = independently of each other, Ti and/or Zr;

R = an alkyl group with 1 to 4 carbon atoms, in particular 1 to 2 carbon atoms;

L = α -hydroxycarboxylate ($-\text{CH}(\text{OH})\text{-COO}^-$),

α -aminocarboxylate ($-\text{CH}(\text{NH}_2)\text{-COO}^-$),
 β -diketonate ($[-\text{C}(-\text{O}^-)=\text{CH-C}(=\text{O})\text{R}^{\text{x}}]$);
with R^{x} = alkyl, preferably C_1 to C_6
alkyl, particularly preferably C_1 to
 C_3 alkyl, in particular methyl,
sulfonate ($-\text{SO}_3^-$) or phosphonate
($-\text{PO}_3^{2-}$), particularly preferably
carboxylate ($-\text{COO}^-$);

- Sp = an alkylene group with 1 to 18
carbon atoms, an oxyalkylene group with
1 to 18 carbon atoms and 0 to 6 oxygen
atoms or an arylene group with 6 to 14
carbon atoms, the spacer Sp being able
to contain one or more, preferably 0 to
2 of the groups O, S, CO-O, O-CO, CO-
NH, NH-CO, O-CO-NH, NH-CO-O and NH;
particularly preferably, Sp is an
alkylene group with 1 to 6, in
particular 1 to 3 carbon atoms or is
absent;
- Z = an ethylenically unsaturated group,
an epoxide, oxetane, vinyl ether,
1,3-dioxolane, spiroorthoester,
particularly preferably a methacrylic
and/or acrylic group;
- a = 2 to 11;
- b = 0 to 4.

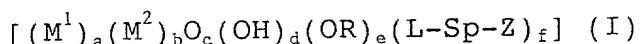
3. Dental material according to claim 2 or 3,
characterized in that L-Sp-Z stands for acrylate,
methacrylate, oleate, allyl acetoacetate and/or
acetoacetoxyethyl methacrylate.

4. Dental material according to one of claims 2 to
4, characterized in that the clusters 1 to 4
contain kinds of ligands of the type L-Sp-Z.

5. Dental material according to one of claims 2 to 5, characterized in that the cluster has a monodisperse mass distribution.
6. Dental material according to claim 2 or 6, characterized in that the indices c to f assume values such that the positive charges of the metal or metals are completely equalized.
7. Dental material according to one of claims 2 to 7, characterized in that M^1 is equal to M^2 .
8. Dental material according to one of claims 2 to 8, characterized in that it contains one or more further polymerizable components.
9. Dental material according to claim 9, characterized in that the further polymerizable component is a polymerizable polysiloxane, an ionically and/or radically polymerizable organic monomer or a mixture thereof.
10. Dental material according to one of claims 2 to 10, characterized in that it contains an initiator for ionic and/or radical polymerization, filler and/or further additives.
11. Dental material according to one of the previous claims, characterized in that it contains, relative to its overall mass
 - (a) 5 to 90% wt.-% of at least one cluster according to formula (I),
 - (b) 10 to 90 wt.-% of a further polymerizable component,
 - (c) 0.1 to 5.0 wt.-% polymerization initiator, and

(d) 0 to 90 wt.-% wt.-% filler.

12. Use of a cluster of the general formula



in which

M^1 , M^2 independently of each other, stand for a metal atom of the IIIrd or Vth main groups or the Ist to VIIth sub-groups of the periodic table;

R is an alkyl group with 1 to 6 carbon atoms;

L is a co-ordinating group with 2 to 6 complexing centres;

Sp is a spacer group or is absent;

Z is a polymerizable group;

a is a number from 1 to 20;

b is a number from 0 to 10;

c is a number from 1 to 30;

d, e independently of each other, are in each case a number from 0 to 30;

f is a number from 2 to 30,

any charge of the cluster (I) present being equalized by counterions, as dental material or for the preparation of a dental material.

13. Use according to claim 12 as adhesive, coating material, cement or filling material.

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